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**THEOREM:** *Let  $p$  be the probability that an event will occur in a single trial, where  $0 < p < 1$ ; let  $s$  be the number of trials to be made; and let  $h = [2sp(1-p)]^{-\frac{1}{2}}$ . Then the probability that the number of occurrences of the event will be some number in the set,  $sp - l_2$  to  $sp - l_1$  inclusive, where  $0 \leq sp - l_2 \leq sp - l_1 \leq s$ , is*

$$\frac{h}{\sqrt{\pi}} \int_{l_1}^{l_2} e^{-h^2 x^2} dx + \delta,$$

where  $\lim_{s \rightarrow \infty} \delta = 0$  uniformly.

While this commonly accepted theorem is the most important result of the foregoing set of inequalities, the relations, (11), (13), (16), and (19), are not without some individual importance.

## WESTERN MEETINGS OF MATHEMATICIANS

The American Mathematical Society has been for nearly a quarter of a century the official organization through which scientific activity in mathematics has found expression in this country. In 1894 The New York Mathematical Society, which had then been in existence for six years, was expanded into the American Mathematical Society, and the *Bulletin*, which had been published for three years by the former, was continued by the latter as "A Historical and Critical Review of Mathematical Science."

The regular meetings of the Society were held in New York, except in the case of the summer meetings, which, from the first in 1894 to the nineteenth in 1912, were held respectively in Brooklyn, N. Y., Springfield, Mass., Buffalo, N. Y., Toronto, Can., Boston, Mass., Columbus, O., New York, N. Y., Ithaca, N. Y., Evanston, Ill., Boston, Mass., St. Louis, Mo., Williamstown, Mass., New Haven, Conn., Ithaca, N. Y., Urbana, Ill., Princeton, N. J., New York, N. Y., Poughkeepsie, N. Y., and Philadelphia, Pa. It thus appears that of the nineteen summer meetings, four have been held in the middle west, namely, at Columbus, in 1899, at Evanston in 1902, at St. Louis in 1904, and at Urbana in 1908.

Another notable gathering of mathematicians took place at Chicago in 1893, namely, the International Mathematical Congress held in connection with the World's Columbian Exposition. The papers read at this meeting, including nine by Americans and thirty by representatives of other countries, were published for the Society by the Macmillan Company in 1896. There was also held at Evanston, Ill., from August 28 to September 9, 1893, a Colloquium in connection with the World's Fair, consisting of a series of lectures delivered by Professor Felix Klein, of Göttingen, Germany. These lectures have been published by the Society. Other colloquia have been held from time to time in connection with the summer meetings, at which series of lectures have been delivered by members of the Society, but none of these have as yet been held in the west. The next one, however, is to be at Madison, Wis., in September, 1913, in connection with the twentieth summer meeting of the Society.

In 1896 a conference was called in Chicago by an informal committee of twenty-eight members of the Society to consider the desirability of organizing a Section of the Society in the middle west, in order that the stimulus and inspiration arising from attendance upon frequent meetings might be brought within the reach of those in this vicinity, it being quite impossible for most members in the west to attend the meetings in New York. This conference was held at the University of Chicago, in December, 1896, when a temporary organization was effected and fourteen papers were read. A second conference was called April 24, 1897, at the University of Chicago, when a communication from the Council of the Society was received authorizing the formation of a Section. The formal organization was thus completed and Professor E. H. Moore was made chairman, and Professor T. F. Holgate secretary, of the Chicago Section of the American Mathematical Society. Ten papers were read at this meeting. Since that time thirty-one meetings of the Chicago Section have been held, twenty-four at the University of Chicago, five at Northwestern University, one at Armour Institute, and one at the University of Minnesota in affiliation with the American Association for the Advancement of Science. The total attendance upon these meetings has aggregated 930 members and 288 visitors, and the total number of papers read is 569.

Two other Sections of the Society have been formed in the west, namely, the San Francisco Section, which meets alternately at the University of California and at Stanford University, and the Southwestern Section, which meets at various points including St. Louis, Mo., Columbia, Mo., Lawrence, Kans., and Lincoln, Neb. The latter was organized in November, 1907, and has held in all six meetings at which 79 papers have been read. The former was organized in May, 1902, and has held twenty-two meetings at which 182 papers have been read. The scientific activity shown by the records of these sectional meetings has amply justified the formal action of the Society as stated in By-Law IV, which says:

"Whenever it shall appear to the Council that a sufficient number of members of the Society are desirous of conducting in any locality periodic meetings for the reading and discussion of mathematical papers, the Council may authorize the formation of a Section to be composed at each sectional meeting of such members of the Society as may be present; and the Council shall have the right to withdraw such authorization."

On two notable occasions regular meetings of the Society as a whole have been held in the middle west, and the meetings of the Chicago Section, which would have occurred at the same times and places, were merged in those of the Society. One of these meetings was held in Chicago, on the invitation of the Chicago Section, in April, 1911. It was the first regular meeting of the Society, aside from the summer meetings, to be held away from New York City since its founding there in 1888. It was arranged that this reunion of the eastern and western members should be especially marked by the delivery of President Bôcher's retiring address, which had been postponed from the annual meeting in the preceding December. The attendance upon this meeting numbered 115

persons, including 88 members of the Society who had come from as far east as Massachusetts, as far west as Wyoming, as far north as Minnesota and as far south as Missouri. There were 53 papers read at this meeting aside from Professor Bôcher's address on "Charles Sturm's published and unpublished work on differential and algebraic equations."

The other occasion when a regular meeting of the Society was held in the west was the Cleveland meeting in December, 1912, in affiliation with the American Association for the Advancement of Science.<sup>1</sup> There were 54 papers read in the mathematical sessions on this occasion and 62 members were in attendance.

Perhaps the most important occasion in connection with these gatherings was the series of meetings of mathematicians and engineers held at the University of Chicago in December, 1907, under the auspices of the Chicago Section of the American Mathematical Society, and conjointly with Sections A and D (mathematics and engineering) of the American Association for the Advancement of Science. The sole topic of these meetings was the discussion of the teaching of mathematics to students of engineering, by mathematicians, professors of engineering, and those engaged in the practice of engineering. The attendance was large and representative, including 100 mathematicians and fifty engineers from 23 state universities and technical schools and 12 other universities and colleges. The presentation of papers occupied three half days and resulted in the appointment of a committee of twenty members with Professor E. V. Huntington, of Harvard University, as chairman, to take into consideration the whole question of the mathematical curriculum in technical schools and in technical departments of colleges and universities, and to make their report to the Society for the Promotion of Engineering Education. That report has since been completed in the form of a syllabus of mathematical courses for students of engineering, which can be purchased through the aforesaid Society at 43 E. Nineteenth St., New York City.

The last meeting of the Chicago Section was held at the University of Chicago, March 21-22, 1913. There were 39 papers read during the four half-day sessions and the total attendance numbered 81 persons of whom 51 were members of the Society. The former officers of the Section were reëlected, namely, Professor D. R. Curtiss, Chairman, Professor H. E. Slaught, Secretary, and Professor A. L. Underhill, third member of the Program Committee. The sentiment of the Section was formally expressed in a resolution favoring the custom of having a special address by the chairman upon his retirement from office. The next occasion of the kind will occur at the December meeting, 1913. The last address of this kind was two years ago when Professor L. E. Dickson spoke on the "History of the representations of numbers as the sum of squares." It was the feeling of the members that we need more papers giving a general survey of some broad field and that this custom will serve, to some extent, to meet this desire.

A characteristic feature of the Chicago Section meetings is the full and free discussion of all papers presented, and especially the regular topic on the pro-

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<sup>1</sup> Reported by Professor G. A. Miller in the February, 1913, issue of the MONTHLY.

gram called "Informal Notes and Queries," under which heading opportunity is given for discussion of any questions of mathematical interest that may not arise in connection with the formal papers. Another feature which is emphasized in these meetings is the dinner on the evening between the two days assigned to the program. These dinners are held at the Quadrangle Club of the University of Chicago where ample facilities are provided for social intercourse throughout the evening.

In closing, it should be said that, while the various sections were organized to accommodate members in their attendance upon meetings, there are no designated members of any given sections, but the membership at any meeting of a section consists of those members of the Society who happen to be in attendance. Thus a nation-wide brotherhood of mathematicians is included in the one American Mathematical Society.

H. E. SLAUGHT.

## BOOK REVIEWS.

W. H. BUSSEY, CHAIRMAN OF THE COMMITTEE.

*Solid Geometry developed by the Syllabus Method.* By EUGENE RANDOLPH SMITH. American Book Company, New York, 1913. xii + 211 pages. \$0.75.

This is a book for the teacher of solid geometry who wishes to try something out of the ordinary. The propositions are not proved in full and formal fashion, but in the opinion of the author the book contains as much suggestion and guidance as the student needs. The aim of the book is to encourage original thinking and to reduce mere memory work to a minimum. There are three preliminary chapters, one on the relation between solid geometry and plane geometry, one on methods of attack, and one on the representation of solid figures by drawing. At the end of the book there are 23 pages of college examination questions selected from the questions set by the College Entrance Examination Board and by various colleges.

W. H. B.

*Memoranda Mathematica. A synopsis of facts, formulae, and methods in elementary mathematics.* By W. P. WORKMAN. Clarendon Press, Oxford, 1912. iv + 272 + 28 pages. \$1.75.

Although this book was written especially for the use of the English student, any teacher of college mathematics will find it a valuable addition to his library. The author says: "Most students and teachers of mathematics have at times wished for a book to which they might speedily refer for a particular formula or method. Such a want the author attempts to supply in the present volume, which collects in convenient compass the facts, formulae, and results of elementary mathematics and is intended, not to replace existing text-books, but to be a companion to them all, useful for revision and handy for reference."